

NON-PUBLIC?: N

ACCESSION #: 9405160213

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Oyster Creek, Unit 1 PAGE: 1 OF 4

DOCKET NUMBER: 05000219

TITLE: Turbine Trip/Reactor Scram on High RPV Water Level Due to
Erroneous Main Steam Flow

EVENT DATE: 04/05/94 LER #: 94-003-0 REPORT DATE: 05/03/94

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10
CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: A. U. Sinyak, Engineer Sr. I TELEPHONE: (609) 971-4348

COMPONENT FAILURE DESCRIPTION:

CAUSE: B SYSTEM: SJ COMPONENT: IMOD MANUFACTURER: G080

REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 04/05/94 at 1550 hours a turbine trip and reactor scram occurred due

to high reactor water level. Cause of the event was the failure of a

proportional amplifier which provides a density correction signal to both

A & B steam flow signals. This resulted in a false high steam flow

signal which resulted in the feedwater control system increasing

feedwater flow to the reactor which caused reactor water level to

increase. When water level reached the high level turbine trip setpoint

of 175", the turbine tripped and a reactor scram occurred as designed.

The faulty electronic module was replaced and the feedwater flow control

system was returned to operational status.

END OF ABSTRACT

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DATE OF OCCURRENCE

The event occurred on April 5, 1994 at 1550 hours.

IDENTIFICATION OF OCCURRENCE

On April 5, 1994, at 1550 hours the reactor automatically scrammed due to

a turbine trip on a reactor high water level signal from the Reactor

Protection System (EISS JC). Reactor water level reached the high (175"

TAF) setpoint and initiated a Main Turbine Trip followed by a reactor

scram, as designed.

This event is reportable under 10 CFR 50.73(a)(2)(IV).

CONDITIONS PRIOR TO OCCURRENCE

The Reactor was in the RUN mode, at 1928 MWTH (99.9% of full power).

DESCRIPTION OF THE OCCURRENCE

The initiating event was failure of a proportional amplifier module

(IMOD) in the Reactor Feedwater Control System (EISS SJ) which caused the

total steam flow signal to fail upscale high. The Feedwater Control System was in "three element" control mode and correctly responded by increasing the feedwater flow. All three (3) Main Feedwater Flow Regulating Valves (MFRV-FCV) opened to the extent that the feedwater Dump runout protection flow limit was reached and the runout protection flow controllers took over the function of controlling the MFRVs. This caused the Runout Protection Indicating Lights on Panel 5F/6F to illuminate, which alerted the operators of a transient condition.

Indicated reactor thermal power increased, therefore, operators reduced reactor recirculation flow to reduce power. Reactor water level continued to increase. The reactor high level turbine trip setpoint was reached and the main turbine stop valves tripped closed. Stop valve closure initiated a reactor scram.

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DESCRIPTION OF OCCURRENCE (CONT'D.)

Reactor power was at 85% and reactor pressure was 1002.3 psig at the time of scram. As a result of the turbine trip, the rapid closure of the turbine stop valves caused reactor pressure to increase to 1049 psig.

This was not high enough to lift the Electromatic Relief Valves (RV) - setpoint 10602.5 psig, but sufficient to actuate the Reactor

Recirculation Pump trip logic (ATWS) - setpoint 10503.0 psig. The

duration of this pressure peak was insufficient to actuate the Isolation

Condensers (EIS BL) - time delay 1.5/-1.0 seconds. Although one channel

of the Isolation Condenser initiation logic did time out, the automatic

actuation of the Isolation Condensers requires signals from both logic

channels.

The Reactor Water Level peaked at approximately 185" TAF. The operators

completed the scram follow-up actions, reset the scram, and established a

letdown flow path to reduce Reactor Water Level. As reactor water level

decreased, the operators restarted the CRD pump, reduced the letdown

flow, and restarted one feedwater string. However, the restart of the feedwater pump was not accomplished early enough to prevent a Lo Reactor Water Level scram signal at 137 in. TAF. Subsequently, the normal water level was established, the plant conditions stabilized, and the reactor cooldown was initiated in accordance with approved plant procedures. The transient caused actuation of the following engineered safety features, as designed: - reactor recirculation pump trips (EIS JE) and diesel generator idle start (EIS EK).

APPARENT CAUSE OF OCCURRENCE

The root cause of this event was determined to be a capacitor failure in a proportional amplifier that provides steam flow density compensation to the feedwater control system. When the proportional amplifier failed it caused a false high steam flow signal which caused an increase in feedwater flow and subsequent level increase.

ANALYSIS OF OCCURRENCE AND ASSESSMENT

The HI reactor water level turbine trip is set at 175" TAF, to protect the main turbine from water damage.

This level transient was rapid and did not allow the operators sufficient time to assess the plant condition and to take actions to prevent the trip. A Post Transient Review Group was convened to review the scram event. From review of logs, charts, and computer data, in addition to interviews of personnel involved in the event, the plant response was considered normal.

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ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT- Cont'd

During this event all engineered safety features operated as designed, which maintained sufficient water level to ensure adequate margin to the fuel cladding integrity safety limit. Based upon the above discussion, the safety significance of the scram event is considered to be minimal.

CORRECTIVE ACTION

The short term corrective actions were taken to troubleshoot and repair the faulty hardware, test it, and return it to the operable status. The long term corrective action is to replace the original feedwater flow control system with a digital flow control system. This plant modification has been developed and is scheduled for installation in September of 1994 (15R refueling outage)

FAILURE DATA

Tag No. ID-23J

Component: Proportional Amplifier

Model: GE/MAX 50-563022CAAC1

Manufacturer: General Electric

SIMILAR EVENTS

LER 92-009 Reactor Scram on Low Water Level due to Feedwater Flow

Control Component Failure.

LER 91-005 Automatic Reactor Scram due to Loss of Feedwater Flow

Caused by a Grounded Condensate Pump Motor.

LER 85-006 Reactor Scram Due to Low Reactor Water Level.

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GPU Nuclear GPU Nuclear Corporation

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609 971-4000

Writer's Direct Dial Number:

C321-94-2036

May 3, 1994

U. S. Nuclear Regulatory Commission

Attn: Document Control Desk

Washington, DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station

Docket No. 50-219

Licensee Event Report 94-003

Enclosed is Licensee Event Report 94-003.

If there are any questions please contact George Busch, Manager OC

Licensing at 609-971-4643.

Very truly yours,

John J. Barton

Vice President and Director

Oyster Creek

JJB/GWB/jc

Enclosure

cc: Administrator, Region I

Senior Resident Inspector

Oyster Creek NRC Project Manager

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General Public Utilities Corporation

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